Appendix 8

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REPORT OF THE WORKING GROUP ON SEALS

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1. EXCHANGE OF INFORMATION AND SUMMARY OF SEAL CATCHES IN 2011

Norwegian catches in the Greenland Sea in 2011 was taken by 4 vessels, whereas no Russian seal vessels participated in the area. Due to the uncertain status for Greenland Sea hooded seals, no animals of the species were permitted taken in the ordinary hunt operations in 2011. Only some animals were taken for scientific purposes. The 2011 TAC for harp seals in the Greenland Sea was set at 42 400 1+ animals (where 2 pups balance one 1+ animal), i.e. the removal level that would reduce the population with 30% over the next 10 year period. Total catches in 2011 were

10,134 (including 5,361 pups) harp seals, representing 24% of the identified sustainable levels.

A possible reduction in harp seal pup production in the White Sea may have prevailed after 2003. Due to concern over this, ICES recommended that removals be restricted to 30 062 animals in the White and Barents Sea in 2011. The Joint Norwegian-Russian Fisheries Commission has followed this request and allocated 7 000 seals of this TAC to Norway. On this background, Russian sealing in 2011 was planned to be continued using the new boat-based approach introduced in the White Sea catch in 2008. This catch, using ice class vessels fitted with small catcher boats, would focus primarily on weaned pups (beaters), to a much less extent on adult seals. No white-coats would be taken. However, as was also the case in 2009 and 2010, Russian authorities implemented a ban of all White Sea pup catches. Despite considerable effort from PINRO specialists to explain that a sustainable harvest from the population would be perfectly possible, the Russian authorities concluded that all pup catches in the White Sea should be banned in 2011. Due to this, there were no Russian harp seal catches in the White Sea in 2011. One Norwegian vessel made an attempt to conduct hunting in the southeastern Barents Sea in 2011 – however, due to late start (departure from Tromsø on 20 April) there were very little ice left in the traditional hunting areas in the East Ice and only 200 1+ animals were taken.

Norwegian and Russian catches in 2011, including catches under permits for scientific purposes, are summarized in the table below:

Area/species	**Norway**	**Russia**	**Sum**
GREENLAND SEA			
Harp seals			
Pups	5361	0	5361
Older seals (1yr+)	4773	0	4773
Sum	10134	0	10134
Hooded seals			
Pups	15	0	15
Older seals (1yr+)	4	0	4
Sum	19[1]	0	19
Area subtotal	10153	0	10153
BARENTS SEA / WHITE SEA			
Harp seals			
Pups	0	0	0
Older seals (1yr+)	200	0	200
Sum	200	0	200
Area subtotal	200	0	200
TOTAL CATCHES	10353	0	10353

[1] Animals taken under permit for scientific purposes

2. EXCHANGE OF INFORMATION AND SUMMARY REPORTS OF RESEARCH ACTIVITIES IN 2011

2.1 Norwegian research

2.1.1 Estimation of harp and hooded seal pup production in the Greenland Sea

IMR conducted aerial surveys to assess pup production for populations of both hooded and harp seals in the Greenland Sea in 2007. The results are now published and implemented in the management of both species. Following the request from ICES concerning data rich populations (the most recent abundance estimate should be prepared from surveys and supporting data (e.g., birth and mortality estimates) that are no more than 5 years old), new surveys will be conducted in the Greenland Sea in 2012. Harp seals will be the prime target species since this population is still hunted. If possible, however, both species will be surveyed. Hooded seals have been protected since 2007 – to assess the effect of protection on the pup production, more than 5 years are needed due to the usually 4-5 years age at maturity observed in hooded seals.

2.1.2 Barents Sea harp seal body condition

The resource situation of the Barents Sea ecosystem has varied much the past 40 years; high abundance of capelin has replaced by high abundance of herring and krill and vice versa. Also, the stocks of polar cod and cod has fluctuated much. There is good evidence to suggest that Barents Sea harp seals respond to changes in ecosystem properties, however, we know nothing about the functional predator-prey relationships. Recent Russian aerial surveys, to assess the pup production of this stock in the White Sea in 2004, 2009 and 2010, indicate a decline in pup production. It is not unlikely that this decline is caused by food shortage; food shortage $\rightarrow$ poor body condition $\rightarrow$ reduced pregnancy rates and pup production of the seals. In a Norwegian sampling program conducted during April/May in 1992-2011onboard Norwegian sealers operating in the southeastern Barents Sea (the East Ice), body condition data were collected from a large number of juvenile and adult harp seals. The data were analyzed to determine if there are some year-to-year variations, in particular if there are some changes after 2003 when the possible decline in recruitment to the stock could have occurred. Also, the functional relationship between harp seals body condition and the biomass of major harp seal prey (krill, capelin, herring, polar cod and cod) have been analyzed using general additive models (GAM). Resource abundance data were taken from published literature or stock assessment reports.

Results from the GAM analysis suggests that the body condition of juvenile and adult harp seals varied significantly between years, increasing from 1992 until 2001 and later decreasing towards the lowest body condition in 2011. A significant year effect on pup's body condition was found. Also, there was no difference in body condition between genders. Using available abundance estimates (biomasses) of krill, capelin, polar cod and cod the previous year as predictors suggests significant predator-prey relationships. The body condition of juvenile harp seals were

significantly affected by the available biomasses of polar cod, juvenile herring and cod. Herring and cod had a linear negative impact on the body condition, i.e., the body condition declined linearly with increasing biomass of herring and cod, whereas the relationship between polar cod biomass and seal condition was positive until the biomass of polar cod reached a certain level after which the effect was negative. The predator-prey relationship for adult seals differed from that of the juveniles; increasing biomass of capelin, polar cod, and cod had a significant negative impact on the body condition of adult seals, whereas krill had a positive impact on the body condition. The condition declined and increased linearly with increasing biomass of polar cod and krill, respectively, whereas for cod and capelin the decline flattened out beyond a certain biomass threshold. Also, the functional relationship between the body condition of adult females and pups was analyzed and the results indicate a positive relationship, i.e., poor body condition of pregnant females results in poor body condition of pups.

2.2 Russian research

2.2.1 Estimation of harp seal pup production in the White Sea

As for the past 12 years, Russian multispectral aerial survey of the White Sea/Barents Sea harp seal pup production was carried out on 20-23 March 2010. The survey resulted in an estimate of 163 032 pups (SE=33 342). The Joint ICES/NAFO Working Group on Harp and Hooded Seals (WGHARP) met during 15-19 August 2011 and agreed that the survey appeared to have been carried out very well. Taking into account recommendations from WGHARP, Russian scientists from PINRO focussed on monitoring of ice conditions in the White Sea and adjacent areas of the Barents Sea in 2011. This information has considerable influence on harp seal pup production. Monitoring of the ice conditions were conducted during November 2010 to the end of March 2011. The ice situation in 2011 was very similar to the ice conditions observed in 2010 which was a year with more favourable conditions for survival of pups than in the previous 7 years. Thus, 2011 was also a year with good ice conditions for harp seal whelping, and Russian scientists suggest that most likely the harp seal pup production in 2011 was similar to what was observed in 2010.

2.2.2 Other issues

During late spring, summer and early autumn in 2010, several dedicated expeditions were carried out in the Kola Peninsula coastal zone, using small boats and vessels. In the Barents Sea open area, oportunistic sighting surveys onboard research and fisheries vessels, including the annual joint Russian-Norwegian ecosystem surveys, were carried out. During all surveys mentioned, data on marine mammal distribution and numbers were collected, taking into account also environmental conditions and fish species distributions and biomass. The main aim was to attempt to estimate marine mammals and fisheries interactions on one side, and influence of current climatic changes and human activity on marine mammals on the other. Research on mathematical modeling designed to estimate the total White Sea/Barents Sea harp seal population stock abundance and develop recommendations concerning harvesting strategy were continued.

2.3. Joint Norwegian-Russian work

2.3.1 Joint studies of life history parameters

To assess possible reasons for the apparent difficulties faced by the population of Greenland Sea hooded seals is a challenge. Historical Norwegian, Russian and Canadian data which describe the trends in fertility rate and maturity at average age (MAM) for hooded seals in the Greenland Sea as well as in the Northwest Atlantic have recently been subjected to joint analyses. For Northwest Atlantic hooded seals, estimates of mean age at primiparity (i.e., first birth) was observed to have increased from 4.2-4.5 years in 1956-78 to 6.1 years in 1989-95. Simultaneously, pregnancy rates showed a significant drop from 91-98 % in 1967-87 to 79-74% in 1989. Thus, not all mature hooded seal females produce offspring each year, and this seems to apply to all age groups. There is no evidence neither of absence nor reduction in the fertility of older females.

For the Greenland Sea stock of hooded seals, data on fertility rate and maturity are from 1958-2010. Based on new reproductive samples collected in moulting patches off Northeast Greenland in July 2008 and July 2010, mean age at maturity was estimated at 3.7 (CI=0.4) years, which is considerably lower than the previous estimate of 4.6 years based on Russian moulting patch samples for the period 1990-94 used in previous models. In contrast, proportion based estimates of mean age at primiparity (MAP(P)) were similar for the 2008-10 and the 1991-94 data sets (5.5 years and 5.8 years, respectively) and a common MAP(P) of 5.7 years could be fitted. There were also no indications of consistent trends in frequency based estimates of mean age at primiparity based on both moulting and breeding patch data collected over the period 1958-2010. The most recent estimate of MAM(P) is based on samples collected in July and it is likely that the low estimate of MAM(P) is due to late ovulations in nulliparous females. A similar pattern has been found for Northwest Atlantic hooded seals, which also indicate that these late ovulations do not appear to result in successful pregnancies. Therefore, parity curves may be more appropriate for modeling of hooded seal population dynamics than maturity curves.

3. STATUS OF STOCKS AND MANAGEMENT ADVICE FOR 2012

WGHARP met during 15-19 August 2011 at the British Sea Mammal Research Unit (SMRU) at the Scottish Oceanographic Institute, University of St. Andrews, Scotland, to assess the status and harvest potential of stocks of Greenland Sea harp and hooded seals and harp seals in the White Sea. The advice given by ICES in September 2011, based on the 2011 WGHARP meeting, were used by this Working Group on Seals to establish management advice for 2012 to the Joint Norwegian-Russian Fisheries Commission.

The basis for the advice was a request from Norway in September 2010 where ICES was requested to assess the status and harvest potential of harp seal stocks in the Greenland Sea and White Sea/Barents Sea and of the hooded seal stocks in the Greenland Sea, and to assess the impact on the harp seal stocks in the Greenland Sea and the White Sea/Barents Sea of an annual harvest of: 1) Current harvest levels; 2) Sustainable catches (defined as the fixed annual catches that stabilizes the future 1+ population); 3) Catches that would reduce the population over a 10-year period in such a manner that it would remain above a level of 70% of current level with 80%

probability.

ICES has developed a Precautionary harvest strategy for the management of harp and hooded seals. The strategy includes two precautionary and one conservation (limit) reference levels. The reference levels relate to the pristine population size, which is the population that would be present on average in the absence of exploitation, or a proxy of the pristine population (which in practical terms is referred to as the maximum population size historically observed, N_{max}). A conservation, or lower limit reference point, N_{lim}, identifies the lowest population size which should be avoided with high probability. The first precautionary reference level is established at 70% (N_{70}) of N_{max}.When the population is between N_{70} and N_{max}, harvest levels may be decided that stabilise, reduce or increase the population, so long as the population remains above the N_{70} level. ICES has suggested that this could be done by designing the TAC to satisfy a specific risk criterion which implicate 80% probability of remaining above N_{70} over a 10-year period. When a population falls below the N_{70} level, conservation objectives are required to allow the population to recover to above the precautionary (N_{70}) reference level. N_{50} is a second precautionary reference point where more strict control rules must be implemented, whereas the N_{lim} reference point (set by ICES at 30% (N_{30}) of N_{max}) is the ultimate limit point at which all harvest must be stopped.

The ICES management of harp and hooded seals require that the populations in question are defined as "data rich". Data rich stocks should have data available for estimating abundance where a time series of at least three abundance estimates should be available spanning a period of 10-15 years with surveys separated by 2-5 years, the most recent abundance estimates should be prepared from surveys and supporting data (e.g., birth and mortality estimates) that are no more than 5 years old. Stocks whose abundance estimates do not meet all these criteria are considered "data poor", and should be managed more conservatively.

Population assessments were based on a population model that estimates the current total population size, incorporating historical catch data, estimates of pup production and historical values of reproductive rates. Modifying the model by incorporating the full range of reproductive data available, as requested by ICES in 2009, gave lower, but more realistic, population estimates and catch options than in the previous modelling. The modelled abundance is projected into the future to provide a future population size for which statistical uncertainty is provided for various sets of catch options. In case of data poor populations, catch limits are estimated using the more conservative Potential Biological Removal (PBR) approach.

3.1. Greenland Sea

The Working Group **recommends** the opening dates for the 2011 catch season to be between 1 and 10 April for catches of both weaned harp seal pups and adult moulting harp seals. The Group recommends a closing date set at 30 June (2400 GMT) for harp seals. Exceptions on opening and closing terms may be made in case of unfavourable weather or ice conditions.

The Working Group agree that the ban on killing adult females in the breeding lairs should be maintained in 2012.

3.1.1 Hooded seals

Results from the most recent (2007) pup survey suggest that current pup production remains low, and significant lower than observed in a comparable 1997 survey. The historical data on pregnancy rates that are available for this population are unreliable. Hence, the population model was run for a range of pregnancy rates, in addition to a run using the original model assuming constant reproduction rates. All model runs indicate a decrease in population abundance from the late 1940s and up to the early 1980s, and gave point estimates for the total population ranging between 85 000 and 106 000 animals, i.e., a population currently well below the N_{lim} of 172,577 (30% of the N_{max} estimate of 575,257).

Catch estimation: Following the Precautionary harvest strategy and the fact that the population is below N_{lim}, ICES recommend that no harvest be allowed for Greenland Sea hooded seals at this time.

The Working Group recommends that this ICES advice is implemented in future managenment of hooded seals in the Greenland Sea: Removals should still be prohibited until more information about current stock status becomes available.

3.1.2 Harp seals

Using the modified population assessment model, the size of the Greenland Sea harp seal population was estimated as 649,570 (95% C.I. 379 031 – 920 101) animals in 2011. Incorporation of historical reproductive rate data in the model resulted in a smaller population than was reported previously. Nevertheless, this revised and presumably more realistic estimate still indicates that this is the largest population size to date.

Catch estimation: ICES consider this population to be data rich, and above the N_{70} level (i.e., more than 70% of known maximum abundance measured). Thus, it is appropriate to provide catch advice using the assessment model and to apply the Precautionary harvest strategy. Current catch level will likely result in an increase in population size of 23% over the 10 years period 2011-2021, whereas a catch of 16 737 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups), per year would sustain the population at present level over the same period.

Catches that would reduce the population over a 10-year period in such a manner that it would remain above a level of 70% of current level with 80% probability are 25,000 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups), in 2012 and subsequent years. Any allowable catch should be contingent on an adequate monitoring scheme to detect adverse impacts before it is too late for them to be reversed, particularly if the TAC is set at a level where a decline is expected.

The Working Group recommend that the advice from ICES be used as a basis for the determination of a TAC for harp seals in the Greenland Sea in 2012:

- *If the management objective is to maintain the population at current level, a TAC of 16 737 1+ animals or an equivalent number of pups, is recommended.*
- *If the management objective is to reduce the population towards N_{70} over a 10-year period, a TAC of 25 000 1+ animals, or an equivalent number of pups, is recommended.*

In both harvest scenarios, one 1+ seal should be balanced by 2 pups.

3.2 The Barents Sea / White Sea

Current Russian regulations allows for seal hunting in the White Sea and southeastern Barents Sea from 20 March to 1 May. Both Parties **recommends** an extension of the hunting season which should include the entire period from 20 March to 15 May for the whole area. Exceptions from opening and closing dates should be made, if necessary, for scientific purposes.

The Working Group agreed that the ban on killing adult harp seal females in the breeding lairs should be maintained in 2012.

3.2.1. Harp seal.

Russian aerial surveys of White Sea harp seal pups were conducted March 2004, 2005, 2008, 2009 and 2010 using traditional strip transect methodology and multiple sensors. The results obtained may indicate a reduction in pup production as compared with the results obtained in similar surveys in 1998-2003:

YEAR	ESTIMATE	C.V.
1998	286,260	.150
2000	322,474	.098
	339,710	.105
2002	330,000	.103
2003	327,000	.125
2004	231,811	.190
	234,000	.205
2005	122,400	.162
2008	123,104	.199
2009	157.000	.108
2010	163,032	.198

As a result of the 2009 and 2010 surveys, regarded to be good by WGHARP, the Working Group feel that the reduced pup production observed since 2004 does not appear to be a result of poor survey timing, poor counting of imagery, disappearance/mortality of pups prior to the survey or increased adult mortality. According to WGHARP, the most likely explanation for the change in

pup production seems to be a decline in the reproductive state of females.

Both the original and the modified population model used for the White Sea/Barents Sea harp seal population, provided a poor fit to the pup production survey data. Nevertheless, WGHARP decided to use the modified model which was assumed to provide the most reasonable future prediction. Modifying the model by incorporating historical reproductive data produced a lower estimate and a conservative projected population. The total size of the population was estimated as 1,364,700 (95% C.I. 1 230 384 – 1 498 916).

Catch estimation: Based on current data availability, the Barents Sea / White Sea harp seal population is considered to be data rich, and above the N_{70} level by ICES. Thus, it is appropriate to provide catch advice using the modified assessment model and to apply the Precautionary harvest strategy. Current catch level will likely result in an increase in population size of 11% over the 10 years period 2011-2021, whereas a catch of 15 827 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups), per year would sustain the 1+ population at present level over the same period.

Catches that would reduce the population over a 10-year period in such a manner that it would remain above a level of 70% of current level with 80% probability are 25,000 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups), in 2012 and subsequent years.

The Working Group recommend that the advice from ICES be used as a basis for the determination of a TAC for harp seals in the White Sea / Barents Sea in 2012:

- *If the management objective is to maintain the population at current level, a TAC of 15 827 1+ animals or an equivalent number of pups, is recommended.*
- *If the management objective is to reduce the population towards N_{70} over a 10-year period, a TAC of 25 000 1+ animals, or an equivalent number of pups, is recommended.*

In both harvest scenarios, one 1+ seal should be balanced by 2 pups.

3.2.2 Other species

The Working Group agreed that commercial hunt of bearded seals should be banned in 2012, as in previous years, but it **recommend** to start catch under permit for scientific purposes to investigate results of long time protection.

4. RESEARCH PROGRAM FOR 2012+

4.1. Norwegian investigations

4.1.1 Estimation of harp and hooded seal pup production in the Greenland Sea

Data for pup production estimation were obtained from both harp and hooded seals in the

Greenland Sea in March/April 2007. To meet the ICES request of data-richness, new surveys will be conducted in 2012. Harp seals will be the prime target species – if possible, also hooded seals will be surveyed. Planned cooperation with Canada and Russia may secure that all North Atlantic stocks are surveyed simultaneously.

4.1.2 Studies of life history parameters

Biological material, to establish age distributions in catches as well as health, reproductive and nutritive status of the animals, will be collected from commercial catches of harp seals in the Greenland Sea in April/May in 2012.

4.1.3 Seal physiology

On research cruises to the Greenland Sea in March/April 2012, various physiological parameters of harp and hooded seals will be studied.

4.1.4 Harp seals taken as by-catches in gill nets

Provided harp seals invade the coast of North Norway also during winter in 2012, biological samples will be secured from animals taken as bycatches in Norwegian gill net fisheries.

4.2.Russian investigations

4.2.1 Estimation of White Sea/Barents Sea harp seal pup production

The plan is to continue annual multispectral aerial surveys to estimate pup production – subsequently these data will be used to determine the total harp seal population size by modelling. This information is very important, both for the management of the stock and for the Joint Norwegian-Russian Research Program on Harp Seal Ecology. This research will be carried out under recommendations from WGHARP 2011 and the JRNFC 40th Session.

4.2.2 White Sea/Barents Sea harp seal population biology

Research on harp seal reproductive biology is planned to be carried out in the White and the Barents Seas. The aim is to study harp seal biological data such as mortality, maturity, birth rate, and morphological and physiological indexes. During spring, work will be continued on pup mortality estimation in the White Sea. Plans include also continuation of research on harp seal feeding in the White and the Barents Sea during spring and summer. All these research activities will be carried out under the Harp Sea Ecology Programme and recommendations from WGHARP 2011 and JRNFC 40th Session.

4.2.3 Marine mammal species distribution and numbers

In 2012 annual research of marine mammal distribution and numbers in dedicated special surveys using research aircraft, research and commercial fisheries vessels, as well in the coastal zones (on

base of small boats and coastal sightings using) as in the open area of the Barents Sea, will be continued. The main purpose these surveys are study of marine mammal role in the Barents Sea ecosystem including influence upon fisheries as top predators.

4.3. Joint Norwegian - Russian investigations

4.3.1 Joint Research program on harp Seal Ecology

Harp seals are the most important marine mammal top predators in the Barents Sea. To be able to assess the ecological role of harp seals by estimation of the relative contribution of various prey items to their total food consumption in the Barents Sea, more knowledge both of the spatial distribution of the seals over time, and of their food choice in areas identified as hot-spot feeding areas is urgently needed. For this reason, the Joint Norwegian-Russian Fisheries Commission has decided to initiate a joint research program on harp seal ecology aimed to:

- assess the spatial distribution of harp seals throughout the year (experiments with satellite-based tags)
- assess and quantify overlap between harp seals and potential prey organisms (ecosystem surveys)
- identify relative composition of harp seal diets in areas and periods of particular intensive feeding (seal diet studies in selected areas)
- secure the availability of data necessary for abundance estimation
- estimate the total consumption by harp seals in the Barents Sea (modelling)
- implement harp seal predation in assessment models for other relevant resources (modelling)

The program was adopted by the Joint Norwegian-Russian Fisheries Commission in 2006. Although both ecosystem surveys and abundance estimation of harp seals are in progress, the core activities of the program have not yet been properly started. The parties had planned to deploy satellite transmitters on harp seals in the White Sea in late May in 2007-2011. However, the Federal Technical Committee has forbidden all satellite tagging in Russian waters in all years. Both parties strongly regret the decision made by the committee.

New attempts will be made to tag seals in the White Sea in 2012. The duration of the program will be 2012-2015. As part of the Joint Norwegian-Russian Research Program on Harp Seal Ecology, these telemetric investigations of harp seals will be given priority over other planned research on harp seals of the White/Barents Seas population in 2012.

4.3.2 Life history parameters in seals

Russian scientists have participated in scientific work on Norwegian sealers during March-May both in the southeastern part of the Barents Sea and in the Greenland Sea. This type of Norwegian-Russian research cooperation is encouraged also in the future. This would enable coordinated and joint sampling of new biological material. If Russia can realize scientific or commercial vessel trips in the White, Barents and Greenland Seas, invitation for participation of Norwegian scientists is desirable.

Available, new material from Greenland Sea hooded seals (collected in 2007-2010) will be analyzed and compared with historical data (1956-1994) in 2012.

4.3.3 Reconnaissance of possible new harp and hooded seal breeding patches in the Greenland Sea

Substantial changes in extent and concentration of drift ice in the Greenland Sea may have triggered behavioral changes of such a magnitude as a relocation of breeding for at least parts of the seal populations. The Working Group **recommends** that this is further examined by using aerial surveys.

4.3.4 Reconnaissance of possible new harp seal breeding patches outside the White Sea

Possibilities to account for the reduced harp seal pup production in the White Sea since 2004 include a shift in contemporary pupping to areas outside of the traditional areas. During the late 1980s or early 1990s, some reports of harp seal pups being observed in Svalbard were received. Therefore, the Working Group conclude that it is important that areas in the northern and southeastern Barents Sea and Kara Sea (south western part) be searched during future aerial reconnaissance surveys.

4.3.5 Population model improvements

Work with improvements of the population model used for northeast Atlantic seal stocks, incorporating variable reproductive parameters and, if possible, also observed ecological variations, continues. This work occurs in close cooperation with Canadian scientists, but also other relevant institutions (e.g., SMRU in St. Andrews) may be included.

4.3.5 Comparison of methods used in pup production estimation

The Parties plan to continue work on comparison of methods used in pup production estimation, including both reading of images and subsequent calculations of the aerial survey data. This will continue the successful work started in 2009, and should include participation from Canada and Greenland.

4.4. Necessary research takes

For completion of the proposed Norwegian and Russian research programs, the following numbers of seals are planned to be caught under special permits for scientific purposes in 2011:

Area/species/category	Russia	Norway
Barents Sea / White Sea		
Whelping grounds		

Adult breeding harp seal females	200	0
Harp seal pups	100	0
Outside breeding period		
Harp seals of any age and sex	520	300
Greenland Sea		
Whelping grounds		
Adult breeding harp seal females	0	0
Harp seal pups	0	0
Adult breeding hooded seal females	0	50
Hooded seal pups	0	50
Outside breeding grounds		
Harp seals of any age and sex	0	100
Hooded seals of any age and sex	0	0

5. OTHER ISSUES

5.1 Bans on seal hunting and products

From a scientific point of view there is no doubt that harp and hooded seal stocks in the North Atlantic are well managed and sustainably harvested with acceptable hunting methods. This is acknowledged both by ICES and NAMMCO. For this reason the Working Group regrets the decision by Russian authorities to implement a ban on all hunting of weaned harp seal pups in the White Sea in 2009, 2010 and 2011 Also, the Working Group strongly regrets the recent political and emotion-driven ban on all import of seal products in EU. As also concluded by NAMMCO, this is a non-scientific step backwards in relation to requested ecosystem based management of all marine resources, seals included. Excluding the possibilities to harvest at all levels in the ecosystem may in the long run have implications for harvest possibilities at other levels than those decided to be excluded. If the subsequent results are reduced harvest possibilities for some species, the Working Group suggest that it be discussed whether the costs of such reductions should be covered by EU itself (e.g., by quota reductions) since this organization implemented the ban.

5.2 Observations of marine mammals on the ecosystem surveys

Marine mammal observers have participated on the joint Russian–Norwegian ecosystem surveys since 2003, and has covered periods of low capelin abundance (2003-2007) and high capelin abundance (2007-2010). When capelin abundance was low, the majority of the baleen whales (fin, humpback and minke whales) inhabited the northern Barents Sea, and overlapped extensively with krill, amphipods and polar cod, and to a minor degree with capelin. After the capelin recovery, the whales inhabit the same areas, but the overlap with capelin increased due to

a greater capelin immigration to the northern whale habitats. Thus, the capelin abundance and distribution does not appear to have a major impact on the late summer distribution of whales in this system. The persistent distributions of whales across years with contrasting prey abundances suggest that the whales are tied to specific habitats that are favorable relative to their foraging behavior (e.g., shallow banks) rather than the distribution of a specific prey species, and that the diet also include a variety of prey species within the whale habitats. A smaller proportion of fin and minke whales also inhabit the shelf break and the southern Barents Sea, in areas with elevated densities of blue whiting and herring suggesting predator-prey relationships. However, the predation rates in these areas must be low, due to the low whale densities compared to the northern areas.

The white-beaked dolphins are the most numerous toothed whale in the Barents Sea, but the ecology of this species in this system is not known. A master project at IMR / University of Bergen by Johanna Fall recently showed that the white-beaked dolphins are not as tied to the capelin as previously assumed. The polar front was indeed an important habitat for the dolphins, a habitat also used by the capelin. Nevertheless, a rather large proportion of the dolphins inhabited the southern Barents Sea, in association with blue whiting. Data from the ecosystem survey suggest that the white-beaked dolphin abundance is increasing in the Barents Sea. These dolphins are known to shift northwards with a warming of the oceans, resulting in e.g. emigration from the northern North Sea. Thus, an increasing trend in the Barents Sea could be due to increased immigration due to higher sea temperatures.

5.3 Joint research program on grey seals

In Norway grey seal pup production surveys aimed to cover all the breeding colonies along the entire coast were conducted in 2006-2008 using boat based as well as aerial surveys. There are large breeding colonies of grey seals located on the Murman Coast in Russia. Previous tagging experiments have shown that there is exchange of seals between these colonies and feeding areas in North Norway. Abundance estimation, using pup counts, in the Russian colonies has not been performed since 1991. For this reason, both Parties **recommend** that the Russian grey seal breeding colonies at the Murman Coast should be covered again. Ideally each colony should be visited three times (minimum twice) during the breeding period. The Parties discussed possibilities of multispectral surveys carried out by PINRO using a smaller aircraft. Norwegian participation in the grey seal surveys in Russia is highly recommended by both Parties. Traditionally the Russian grey seal colonies have been surveyed by Murmansk Marine Biological Institute (MMBI), and continued cooperation with MMBI is encouraged.

The parties agreed that this task can be most effectively solved within the frames of a future joint research program, preferably developed within the frames of the JRNFC. In addition to abundance estimation, also other important issues should be addressed:

- Stock identity: Do the Murman Coast grey seal colonies constitute isolated stocks, or are they part of the stock distributed in North Norway north of Vesterålen? This question can be addressed using genetic analyses.
- Spatial distribution and habitat use, e.g., what are the feeding areas for the Russian grey seals? Could be addressed by using satellite tags.

- Feeding habits and conflicts with fisheries and fish farming (diet studies).

6. APPROVAL OF REPORT

The English version of the Working Group report was approved by the members on 13 October **2011.**